PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 91B0091P.WO41	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IT 03/00816	International filing date *(day/month/year)* 15.12.2003	Priority date *(day/month/year)* 15.12.2003
International Patent Classification (IPC) or both national classification and IPC INV. B65D35/08		
Applicant BORMIOLI ROCCO & FIGLIO S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.09.2004	27.03.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Rodriguez Gombau, F Telephone No. +49 89 2399-6046

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT 03/00816

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

2-7	as originally filed
1, 1a	received on 23.01.2006 with letter of 20.01.2006

Claims, Numbers

1-8	received on 23.01.2006 with letter of 20.01.2006

Drawings, Sheets

1/3-3/3	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the writtense quence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☐ the claims, Nos.:
   - ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

   ☒ restricted the claims.

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☒ complied with.

   ☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

   ☒ all parts.

   ☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-8
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-8
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-8
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

1. Reference is made to the following documents:

   D1: GB 847 947 A (THE BRITISH XYLONITE CY) 14 September 1960 (1960-09-14)
   D2: WO 03/099544 A (NORDEN TUBES) 4 December 2003 (2003-12-04)

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

   "An improved tube made of a plastic material, comprising a lower part which is open for introduction of a product and closable after the introduction, and an upper part which exhibits a passage-hole (cf. fig. 1 element 11) for exit of the product from the tube, the upper part comprising an opening (cf. fig. 2), which is larger than the passage-hole (cf. fig. 2 element 11) and is arranged in a zone of the upper part in which the passage-hole (cf. fig. 2 element 11) is to be made; the tube comprising a reducer element (cf. fig. 2 element 4) in which the passage-hole (cf. fig. 2 element 11) is made, which reducer element (cf. fig. 2 element 4) is conformed and arranged in order to fit sealingly in the opening (cf. fig. 2)."

   The subject-matter of claim 1 differs from this known tube in that **the tube comprises a threaded mouth having a cylindrical shape and onto which a closure cap is screwed, at which threaded mouth the opening is afforded, the reducer element comprising a disc which rests superiorly on the threaded mouth when the reducer element is fitted into the opening, the reducer element comprising a film which is heat-welded onto an upper part of the disc in order to close the passage-hole.**

   The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

2.1 The problem to be solved by the present invention may be regarded as to provide a tube with means to guarantee the sealing of the mouth.

2.2 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

I) The combination of the features of independent claim 1 is neither known from, nor rendered obvious by, the available prior art.

2.3 Claims 2-8 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Description

An Improved Tube made of a Plastic Material

Technical Field

The invention relates to an improved tube made of a plastic material.

Background Art

The prior art contains tubes made of a plastic material, which are used in substitution of metal tubes. Reference is made especially to tubes destined to contain fluid products such as cosmetic creams and cosmetic products in general. These tubes usually comprise an open lower part for introduction of the product, which lower part can be permanently closed after the product has been introduced. They also comprise an upper part which includes a passage hole for the exit of the product from the tube. These tubes are made either by welding the upper part, generally produced by injection-moulding, to a drawn cylindrical tube, or by pressing the whole tube in one piece, using plastic material injection techniques in a shaped die.

Document GB 847,947 discloses a closure and dispensing arrangement for squeezable containers of a flexible plastic, such as polyethylene, which comprises a polyethylene plug with a disc part and a cylindrical skirt having a barbed annular rib. The polyethylene plug is inserted in the upstanding neck 2 of the container and rib 6 snaps into a groove 7 in the neck. The disc part 4 is then held flat against the rim of the neck. In a modification the skirt has in addition a lower flange to engage below the container neck.

Document WO03099544 discloses to a tube made of polymer material and injection moulded in one piece, comprising a tube body, a tube shoulder and

a closure connected to the tube shoulder via a hinge. The tube shoulder has an emptying opening and at least one intake point. The closure has at least one intake point. The tube shoulder comprises material which has flowed in through intake points in both the tube shoulder and the closure.

The tubes thus manufactured are sent on to the cosmetic producer who fills them by introducing the product via the open bottom, then welds the tubes closed and removably closes the top part thereof by applying a cap which will enable the user to open the tube to obtain the product in the necessary doses and also to close the tube before a next use thereof. The closure of the passage hole is generally obtained either by a screw-cap screwed onto a thread provided at the passage hole, or by a pressure-fit cap provided with a stalk which inserts sealingly in the passage hole.

As with all objects having a modest unit cost but high production numbers, the main problem the producers have to face and solve is how to limit production

Claims.

1). An improved tube made of a plastic material, comprising a lower part (1a) which is open for introduction of a product and closable after the introduction, and an upper part (1b) which exhibits a passage-hole (2) for exit of the product from the tube, ~~wherein:~~ the upper part (1b) ~~comprises~~**comprising** an opening (3)~~,~~ ~~being~~ **which is** larger than the passage-hole (2) and **is** arranged in a zone of the upper part (1b) in which the passage-hole (2) is to be made~~; wherein~~ the tube ~~comprises~~**comprising** a reducer element (4) in which the passage-hole (2) is made, which reducer element (4) is conformed and arranged in order to fit sealingly in the opening (3); **characterised in that it comprises a threaded mouth (1c) having a cylindrical shape and onto which a closure cap is screwed, at which threaded mouth (1c) the opening (3) is afforded, the reducer element (4) comprising a disc (4b) which rests superiorly on the threaded mouth when the reducer element (4) is fitted into the opening (3), the reducer element (4) comprising a film (5) which is heat-welded onto an upper part of the disc (4b) in order to close the passage-hole (2).**

2). The tube of claim 1, wherein: the opening (3) has a circular section and is made on a perpendicular plane to an axis of the tube; the reducer element (4) comprises an external ring (4a) which fits into the opening (3); the passage-hole (2) is arranged concentrically to the external ring (4a).

~~3). The tube of claim 2, comprising a threaded mouth (1c) having a cylindrical shape and onto which a closure cap is screwed, at which threaded mouth (1c) the opening (3) is afforded, wherein: the reducer element (4) comprises a disc (4b) which rests superiorly on the threaded mouth when the reducer element (4) is fitted into the opening (3); the reducer element (4) comprising a film (5) which is~~

~~heat-welded onto an upper part of the disc (4b) in order to close the passage-hole (2).~~

~~4).~~**3).** The tube of claim 2, comprising a pressure-fit cap (6) provided with a stalk (6a) which sealingly inserts into the passage-hole (2), wherein the reducer element (4) comprises: an annular crown (4c) which rests on an internal wall of the upper part of the tube when the reducer element (4) fits into the opening (3); an internal ring which is concentric to the external ring (4a), and which defines the passage-hole (2) and is destined to house the stalk (6a).

~~5).~~**4).** The tube of claim 1, wherein the upper part (1b) of the tube is made by injection moulding.

~~6).~~**5).** The tube of claim 1, wherein the lower part (1a) and the upper part (1b) of the tube are made in a single piece by injection moulding.

~~7).~~**6).** The tube of claim ~~4~~ **3**, wherein the pressure-fit cap (6) is made of a material which is different to and harder than a remaining part of the tube; the reducer element (4) being made of a same material as the remaining part of the tube.

~~8).~~**7).** The tube of claim ~~7~~ **6**, wherein the pressure-fit cap (6) is made of polypropylene; the remaining part of the tube and the reducer element (4) are made of polyethylene.

~~9).~~**8). The tube of claim 1,** ~~An improved tube made of a plastic material, comprising a lower part (1a) which is open for introduction of a product and closable after the introduction, and an upper part (1b) which exhibits a passage-hole (2) for exit of the product from the tube, and~~ comprising a pressure-fit cap (6) provided with a stalk (6a) which sealingly inserts in the passage-hole (2), wherein: the pressure-fit cap (6) is made of a material which is different to and harder than a material used for a remaining part of the tube and is made by multiple injection-moulding of different plastic materials in a single piece with the remaining part of the tube.